at the ancient connection between South Africa, Australia and South America. His sketch of the geology of Central Africa, written in 1857, his description of the former plutonic activities of the south-west Tanganyika region, of the coal-bearing strata of the Ruvuma and west Nyasaland, and his hearsay reports of the gold and copper of Katanga have stood the test of time in their substantial accuracy. His meteorological records of the rainfall, temperature and climate of Central Africa still await publication.

Indeed, it is possible that much of Livingstone's scientific research work has never yet been published, and that when it is disinterred and printed we may find ourselves still further indebted to this missionary-consul-explorer for valuable information about the southern third of Africa.

H. H. JOHNSTON.

PLANT DISEASES AND INSECT PESTS.

MOST of the investigations on this subject are carried out at agricultural research institutions and have for their primary object the discovery of means for destroying the pest, rather than the elucidation of the relationship between the host and the parasite. Yet the latter problem must be of extraordinary interest, and we can only hope that the investigators will turn to it as soon as some of their pressing economic problems are solved.

Of the British Colonial departments, the West Indian is among the most prolific in publications on these subjects. The papers are issued in the reports of the various schools and departments and in *The West Indian Bulletin*. No. 4, vol. xii., of this journal contains papers by H. A. Ballou, J. R. Bovell, and F. W. South on the use of entomogenous fungi in combating scale insects in Barbados, one of the most interesting methods of pitting one organism against another for the benefit of mankind. Fungi parasitic on the insects are cultivated and the spores distributed: they are then applied to the insects directly these appear on the tree. The authors are very hopeful about the method; one, indeed, thinks it may enable most of the insect pests to be kept in check.

The bud rot of the cocoa-nut palm, described by J. B. Rorer in another paper, is an interesting example of a bacterial disease of plants. The disease has been much studied in the United States by Johnston (Bull. 228, U.S. Dept. of Agriculture), who comes to the remarkable conclusion that it is caused by *Bacillus coli.*

The United States Department of Agriculture and the entomological laboratories of the various colleges are, however, by far the most active investigators of plant diseases and insect pests. From the department itself issues a continuous stream of publications which we cannot pretend adequately to review. A. L. Quaintance has recently, in Circular 154, described the leaf blister mite (*Eriophyes pyri*, Pagenstecher), one of the smallest animals (they are not true insects) attacking horticultural crops. H. M. Russell, in Circular 151, deals with the greenhouse thrips (*Heliothrips haemorrhoidalis,* Bouché), which does considerable damage in attacking ornamental plants. E. S. Tucker, in Circular 152, describes the rice water-weevil (*Lissorhoptrus simplex*, Say), the larvæ of which feed on the roots of rice plants, while the adult weevils cause some harm by feeding on the rice leaves; altogether, this insect is regarded as the most serious enemy of rice in the southern States.

The Hawaiian Station has issued an account of Dr. Lyons's investigation of the curious sugar-cane disease known as *iliau,* endemic in the island and not known elsewhere. He traces it to a fungus producing two types of fruiting bodies: a perfect form belonging to the genus Gnomonia and an imperfect form referable to the genus Melanconium; he proposes to call it *Gnomonia iliau.*

NOTES.

THE ninth International Congress of Zoology now sitting at Monaco, under the presidency of H.S.H. the Prince of Monaco, was opened on Tuesday at the Oceanographical Museum. There are seven sections and one subsection, as follows:—(1) Comparative Anatomy and Physiology; (2) Cytology and General Embryology; (3) Systematic Zoology; (4) General Zoology, Palæozoology, and Zoogeography; (5) Oceanographical Zoology and Plankton; (6) Applied Zoology, Parasitology, and Museums; (7) Zoological Nomenclature; subsection, Entomology. Every consideration for the convenience and comfort of members has been given. The sections meet in the Oceanographical Museum and Lyceum, close by. The common subject of conversation of members is concerning zoological nomenclature; we learn that there have been several preliminary unofficial meetings, and that proposals are forthcoming which will probably result in a decision satisfactory to zoologists in general. The Prince of Monaco opened the proceedings on Tuesday at 6 p.m., after which there was a reception in the museum. The programme shows that there are many and interesting communications. British membership on the opening day exceeds eighty out of a total of 723, the largest yet recorded for any international zoological congress. There is, however, not a proportionate number of British communications; those on the list on Monday were by Prof. Elliot Smith, of Manchester; Prof. J. Arthur Thomson, of Aberdeen; Dr. R. F. Scharff, of Dublin; Mr. E. Hall, of London; Dr. E. J. O. Hartert, of Tring; Dr. W. S. Bruce, of Edinburgh; Dr. M. Annandale and Dr. B. L. Chandhuri, of Calcutta; Dr. R. J. Anderson, of Galway; and Dr. Hornell, of Madras. Lord Walsingham will move an important resolution on zoological nomenclature, and among British members who are likely to take part in this discussion are Dr. S. F. Harmer and the Hon. Walter Rothschild.

EXCEPTIONALLY wild and stormy weather was experienced over the south of England on Saturday, March 22. A severe thunderstorm occurred in the southern counties in the afternoon, and this was followed by a brisk freshening of the wind, which developed during the evening to a violent gale. At 6 p.m. the centre of the storm was over Cornwall, and by 7 a.m. on Sunday morning it had reached Berwick, the disturbance progressing at the rate of more than forty miles an hour. A velocity of sixty-three miles an hour was attained by the wind at Kew at 8.50 p.m., and at 10.35 p.m. the hourly velocity was sixty-five miles an hour. On the south coast of England, where the greatest force of the gale was experienced, the wind attained the velocity of seventy to seventy-five miles an hour. The storm is probably the worst experienced for about the last eight years. Shortly before midnight the wind and sea carried away about 200 yards of the pier at Worthing. Much damage was wrought at Bungalow Town, near Shoreham, and also at Hythe, in Kent.

A SEVERE and destructive tornado occurred in the United States on the evening of Sunday, March 23. The greatest damage was done at Omaha, Nebraska, where about 150 people are said to have been killed and many more injured. The tornado swept the central States, and damage is reported from many places. Blocks of buildings were wrecked, and trains are reported to have been torn from the rails. Fire occurred in the wake of the tornado, and the torrential rain which followed the storm helped materially in extinguishing numerous conflagrations. The path traversed by the tornado is said to have been between 200 and 350 yards wide. At Omaha the storm is reported to have demolished one hundred and fifty houses and eleven churches. A report from Indianapolis states that owing to heavy rains following the tornado, the rivers in the State have overflowed their banks, and it is feared that there will be the worst floods for years. Several towns are reported as submerged.

ON Tuesday next, April 1, Dr. A. Smith Woodward will begin a course of two lectures at the Royal Institution on recent discoveries of early man, and on Thursday, April 3, Dr. E. Frankland Armstrong will begin a course of two lectures on (1) the bridge into life, (2) colour in flowers. The Friday evening discourse on April 4 will be delivered by Dr. J. J. Dobbie on the spectroscope in organic chemistry, and on April 11 by Mr. C. J. P. Cave, on the winds in the free air.

THE second circular of the International Geological Congress, 1913, has recently been issued. A change in the date of the sessions is notified: the meetings of the congress will begin at Toronto on Thursday, August 7, instead of August 21, as previously announced, and will terminate on August 14. The principal subject selected for discussion is "The Coal Resources of the World," and following the excellent precedent of the Stockholm congress, a large monograph on this subject will be prepared. The response from all over the world has been so cordial that the committee hopes to have the two quarto volumes and folio atlas ready in time for the meetings. The price will be twenty dollars the set. Other topics to be discussed are:—(2) Differentiation in igneous magmas; (3) the influence of depth on the character of metalliferous deposits; (4) the origin and extent of the pre-Cambrian sedimentaries; (5) the subdivisions, correlation, and terminology of the pre-Cambrian; (6) to what extent was the Ice age broken by interglacial periods?; (7) the physical and faunal characteristics of the Palæozoic seas, with reference to the value of the recurrence of seas in establishing geological systems. Authors of papers are specially invited to bring specimens to illustrate them, for which ample space will be provided, and the Department of Customs will give facilities for their entry into Canada duty free. A magnificent series of excursions has been planned, which will give an insight into the general geology, and particularly the glacial, pre-Cambrian, and economic geology of Canada. Twelve of these will take place before the congress; ten short excursions will be held during the congress and nine after. The first excursion starts from Montreal on July 13, and the longest of the post-congress excursions will reach Vancouver on September 22. Particulars may be obtained from the secretary of the congress, Victoria Museum, Ottawa, or from any geological society or survey.

MUCH attention is now being paid to the archæological remains in Jersey. In Bulletin No. 3 for 1912 of the Société d'Anthropologie de Paris, Dr. Deyrolle and Capt. Mauger describe the excavation of the tumulus and dolmen known as Teste-du-fief, in the northern part of the island. The owner has wisely decided that, after being opened, the monument is to be, so far as possible, preserved for examination by visitors, in its original condition. Within the dolmen the remains of a man buried beside his horse were discovered. Close to the right hand of the corpse was a small clay vessel, and close by a collection of horse teeth. Further information regarding this important discovery will be awaited with interest.

WE have received a copy of the first number of *Der Fischerbote* (Hamburg) for 1913, which contains much interesting information with regard to German fisheries, both in Europe and East Africa.

A VERY interesting new generic type of side-necked (pleurodiran) tortoise from the Keuper, in the neighbourhood of Stuttgart, is described by Prof. O. Fraas in *Jahresheft Ver. vat. Naturk. Württ.*, 1913, No. 80, under the name of *Proterochersis robusta*. Its peculiarity consists in the presence of two complete pairs of mesoplastral elements in the lower shell, which is believed to be a unique feature in the order. As a mesoplastron seems to be a primitive feature, its duplication appears to represent a still more archaic type. In vol. lx. of the "Palæontographica" (pp. 275–294) the same writer describes several new large labyrinthodonts from the Swabian Trias, one of which is referred to Cyclotosaurus, based on Meyer's *Capitosaurus robustus*, the genus also including the so-called *Capitosaurus stantonensis*, of the Warwickshire Keuper.

The American Naturalist for February contains four addresses on organic and inorganic adaptation in nature, delivered at the Symposium on this subject, at the meeting of the American Society of Naturalists at Cleveland on January 2, and a fifth on the fitness of the environment, being an inquiry into the biological significance of the properties. In the first Prof. Mayfield discusses adaptation through natural selection and orthogenesis, and in the second Prof. Livingston adaptation in the living and non-living, while in the third Prof. Parker considers adaptation in connection with animal reaction, and in the fourth Prof. Mathews reviews the subject from the point of view of the physiologist. As our readers may wonder what is meant by non-living adaptation, it may be mentioned that Prof. Livingston cites the case of pumice fragments in an inundation of the Colorado river. "Had it not been for the floating adaptation, these pumice-pebbles would have suffered temporary extinction in the form of submergence, and would not have been able . . . to gain dominance . . . in certain . . . beaches."

We have received a copy of the issue of February 7 of an apparently new journal, published by the California Associated Societies for the Conservation of Wild Life at San Francisco, under the title of *Western Wild Life Call.* California, it seems, is one of the States in which wild-killed game is still permitted to be sold, and it is one of the main objects of the new venture to obtain the total prohibition of this branch of trade. Among the species or races of animals in imminent danger of extermination in California, even if some of them have not been already killed off, are the wood-duck, the sharp-tailed duck, the prongbuck, two kinds of wapiti, the beaver, and the sea-elephant. The fate which has already overtaken the passenger-pigeon is now threatening the band-tailed pigeon (*Columba fasciata*) in California, a species which has somewhat similar habits, and is now being slaughtered in enormous numbers. So urgent is the case that total prohibition for a period of at least five years, and subsequently an annual close season, are deemed necessary.

Apropos of the correspondence which we have recently had on "retinal shadows," Mr. J. L. Herrick writes suggesting an explanation of the twinkling of distant lights. He has noticed at his home in Yonkers, New York, where there are many street lamps at different distances, that only the more distant lights twinkle, and he thinks that the occultation of the lights may be due to blood corpuscles in the retinal vessels. He applies the same explanation to the twinkling of stars. The latter phenomenon has received many explanations, physical and physiological. With regard to the latter, the subject was brought to the notice of the Physiological Society some years ago by Dr. J. S. Haldane, and was discussed by the members. Several suggestions were advanced, amongst others that it was due to the pulse waves in the retinal vessels. No adequate proof of any of the physiological theories was brought forward, and it is doubtful whether any theory yet adduced amounts to more than a plausible hypothesis.

A report of the experiments carried out for the Durham County Council, on the feeding of dairy cows, has been published in bulletin form (Offerton Bulletin No. 4), by Mr. F. P. Walker. The experiments include a comparison of soya cake with decorticated cotton cake, and Sudan dura with maize. In the former case soya cake gave, if anything, slightly better results than cotton cake, and in the latter dura was shown to be equal in value as a food to maize, and might profitably be adopted as a substitute in times of low prevailing prices. Other experiments with "crowdy" or watery foods as against concentrated foods tend to show that, on the whole, the quantity and quality of the milk are not affected. A possible action of "crowdy" rations in maintaining the flow of milk for a longer period than dry rations is indicated.

Dr. E. J. Russell and Mr. F. R. Petherbridge contribute a paper to the January number of the Journal of the Board of Agriculture on the sterilisation of the soil for glasshouse work. In continuation of earlier experiments on this interesting and complex problem, the authors have investigated the influence of heat and numerous antiseptics on the fertility of tomato-, cucumber-, and vine-sick soils, and have accumulated sufficient evidence to show that one or other of the various modes of treatment might be distinctly useful to practical growers. The effects of treatment may be attributed, in general, to the following changes:—(1) An increased bacterial activity with greater food production; (2) the reduction in numbers or death of disease organisms; (3) a modification of processes going on in the soil, so that certain unusual substances are present which produce special effects on the plant. These lead to early maturity and greater yields of tomatoes, early maturity in the case of cucumbers, and darker green and larger foliage and larger and brighter flowers with chrysanthemums. The best results were obtained in heated soils or those treated with formaldehyde, pyridine, or the higher bases, collidine, lutidine, &c.

Mr. R. Kirkpatrick, after zealous travel, considerable reading of recent geological literature, and painstaking observation, publishes a pamphlet entitled "The Nummulosphere" (Lamley and Co., London, 1913). In this he attempts to resuscitate Eozöon by finding structures of a discoidal nature common to it, to nummulites, and to almost every rock that he examines. The existence of these discs in nummulites is held to prove that all these other materials, including igneous lavas and granites, are of organic origin.

Students of the British Trias will find two papers of interest in the Proceedings of the Liverpool Geological Society, vol. xi., part iii. (1912). Rev. C. E. Spicer (p. 201) writes from personal observations of "Present Trias Conditions in Australia," and Sir T. H. Holland (p. 227) describes "The Origin of Desert Salt Deposits," laying special stress on the carrying of salt as fine dust by prevalent winds across the plains of north-west India. The "red marls" of the Trias are regarded (p. 245) as oxidised representatives of the black muds stained by ferrous sulphide found in modern salt-lakes in desert lands. Reasons are given (p. 246) for regarding the wind-borne salt as insufficient to affect Prof. J. Joly's use of the sodium in rivers and in the ocean as a measure of geological time.

From an educational point of view, no work issued by the United States Geological Survey has been more important than Professional Paper 71, by Mr. Bailey Willis, entitled "An Index to the Stratigraphy of North America" (1912). This memoir of 894 pages is accompanied by a coloured geological map of North America on the scale of 1 : 5,000,000, which includes, not only Mexico, the United States, and Canada, but Central America, the West Indies, Greenland, and Iceland as accessories. We should recommend the mounting of this map on large folding sheets, after the excellent manner of the Oxford wall maps, so that the whole or any of the four sections can be hung up as required. The paper is much more than an "index," since the formations are described in detail, and the views of various authors as to their modes of deposition are freely quoted. Canada is thus represented by her own authorities. The most striking features on the map are the immense areas covered by Tertiary volcanic rocks in the western Cordillera, and, in contrast, the severe pre-Cambrian region of the north-east, beyond the folded Mesozoic strata of the Rocky Mountains.

In common with all other great earthquakes, the Messina earthquake of December 28, 1908, was followed by a large number of after-shocks. A record of the shocks felt at Messina was kept by Mr. G. Spadaro, then a student in the Nautical Institute in that city. During the last four days of 1908, eighty-seven shocks were felt, and during the following year 862. The majority of these shocks were, as usual, very slight, but four (in December, 1908, and January, 1909), were ruinous, and one (in July, 1909) almost disastrous. Dr. Agamennone points out (in the *Rivista di Astronomia,* &c., for last November) that the distribution of these shocks in time does not follow the simple law which, according to Prof. Omori, governs the decline in frequency of Japanese after-shocks, namely $y=k/(x+h)$, where y is the number of shocks in a given interval at time x, and h and k are constants, for the monthly number is greatest in March, 1909, and shows an increase in frequency towards the end of that year.

In the *Revue générale des Sciences* for February 28 Prof. H. Devaux, of the University of Bordeaux, gives a *résumé* of his researches on the properties of thin layers of oil spread on the surfaces of water and mercury, a subject on which he has published a number of papers during the last ten years. It appears that the least thickness of oil which produces an appreciable effect on the surface tension of either water or mercury is much less than has been supposed. If a film of oil the thickness of which is known from its volume and area, is gradually thinned by increase of its area, the surface tension of the surface it covers has the value appropriate to oil until the thickness of the film, $1{\cdot}10 \times 10^{-7}$ centimetre, is less than the mean diameter of an oil molecule, $1{\cdot}13 \times 10^{-7}$ centimetre, as determined by M. Perrin's method. Below this thickness the film of oil does not affect the surface tension of either water or mercury.

The February number of the Journal of the Institution of Electrical Engineers contains the lecture on permanent magnets which Prof. Silvanus P. Thompson delivered at the meeting of the institution at Glasgow last year. It occupies more than sixty pages, gives a complete account of present-day knowledge on the subject, and points out directions in which further research is necessary. The author shows that the most powerful and permanent magnets are made of steels with about 6 per cent. of tungsten and 0·5 per cent. of carbon, and have the ratio of length to breadth large. After forging at as low a temperature as possible the magnets should be heated to 900° C., cooled to 750° C., kept at that for a time, and then cooled off. Hardening is a repetition of this process down to 700° C., at which temperature the magnets are to be plunged into brine at 20° C. Maturing is done by boiling the magnets for ten or twelve hours. Magnetisation is effected by an electromagnet, and there is some advantage in a few reversals. For extreme constancy the magnetisation may be reduced by 5 or 10 per cent. by subjecting the magnets to demagnetising forces. The paper includes a bibliography which will prove of great use to future workers in this field.

Mr. H. G. Seager, of Colwyn Bay, has devised an "automatic control" for aëroplanes, which appears well suited for the purpose of extricating an aviator from the difficulties in which he is placed by a sudden change of the conditions of either longitudinal or lateral equilibrium, such as that due to a gust of wind or a stoppage of the engines. It is perhaps not sufficiently realised that the initial effect of the latter cause is exactly represented by impressing on the machine a wrench equal and opposite to that of the propeller in steady motion, and if the propeller is much below the centre of gravity the result will be to turn the whole machine round until the air strikes on the top of the planes and sends the aëroplane to earth. Mr. Seager employs a pendulum, so arranged that any finite displacement exceeding a certain limit operates one or more air valves controlling pneumatic motors, and these displace the controls through a finite distance proportional to the number of valves operated on, this number depending again on the displacement of the pendulum. The arrangement has the obvious advantage that the pendulum oscillations can be damped out by friction, so that the apparatus can be adapted to an inherently stable aëroplane without interfering with its motion or control except in the case of large disturbances.

In "Untersuchungen über die Gezeiten der feste Erde und die hypothetische Magmaschicht," a recent publication of the Geodetic Institute at Potsdam, Dr. W. Schweydar has made a very important contribution to the investigation into the nature of the earth's interior. His discussion of a long series of horizontal pendulum experiments throws considerable light on the outstanding difference between the coefficient of rigidity for the earth indicated by the Chandler motion of the pole and that given by tidal terms of long period. Consideration of the effects of ocean tides (discussed according to the dynamical theory) upon the semi-diurnal deformation of the solid earth gives the value for the rigidity of the earth as being two or three times that of steel. This value is of the same order as is required to account for the observed wandering of the pole, and also for the diurnal tide in the solid earth. Dr. Schweydar does not set much store by Dr. Hecker's differing results for the values of the east-west and the north-south elasticity, and he gives reasons for not accepting the explanations offered by Hecker and Lallemand. On one other debatable point of much importance Dr. Schweydar's results will be read with much interest. If the earth is to be regarded as consisting of an elastic core, a viscous layer, and a rind, then he decides that this viscous layer cannot be supposed to be of the fluidity of molten metal, but must be regarded as to all practical purposes solid. It need scarcely be stated here that this was the view reached on quite other grounds by the late Sir George Darwin.

In two papers published in the *Atti R. Accad. Lincei* (vol. xxxi., ii., pp. 740 and 803) Profs. R. Nasini and C. Porlezza describe the discovery for the first time of ozone in a natural water, and discuss the possible reasons for its presence therein. The water is that of Le Bagnore of Santa Fiora, in Monte Amiata, and the ozone is not a transitory but a permanent and normal constituent, imparting a distinct odour to the water, and being present to the extent of about 0·15 c.c. per litre. The water is not radio-active, and in default of other possible explanations, the view is put forward that the presence of ozone is due to autoxidation of ferrous bicarbonate, either *per se* or brought about by the action of the so-called iron-bacteria. The water of a spring at Bagnoli, Arcidosso, also in the Monte Amiata district, possesses similar properties, but in a minor degree. Both these waters have locally a high therapeutic reputation, and the question arises whether this is due to the ozone which they contain. Further investigations will be made to decide this and other points as to which there is still some uncertainty.

We have received a copy of the Transactions of the English Ceramic Society, part ii., session 1911–12, which, in addition to a number of papers of technical interest to potters, contains an account, which is of more general interest, of several of the principal pottery works on the Continent. In the summer of 1912 members of the Ceramic Society made a tour of inspection of ceramic works in Holland, Germany, and Belgium, and a report of the visit, admirably illustrated by photographs, covers forty pages of the Transactions. The descriptions given of the Royal Berlin Porcelain Factory at Charlottenburg, founded by Frederick the Great in 1763, and now carried on by the Prussian Government, with 660 workmen, and of the Royal Porcelain Factory at Meissen, founded in 1710, and now employing 800 hands, are of particular interest. The writer of the report expresses regret that no such institutions exist in England:—"In Germany, should a manufacturing potter have an idea which, through lack of capital or initiative, he is unable to work out to fruition, he at once has the assistance of the State pottery to test, and, if necessary, to evolve that idea, whereas in England brains can only be utilised apparently to the accompaniment of capital and risk."

A memorial portrait of the late Capt. Scott in uniform has been published by Messrs. Maull and Fox, the proprietors of the copyright in the only photographs of the explorer in full-dress uniform. The portrait, which is a photogravure, has been approved by Lady Scott, and the publishers have undertaken to contribute an agreed proportion of the profits of the sale of the portrait to the National Fund which is being raised. The price of the portrait is 5*s.* each, and copies can be obtained through the usual trade channels, or from Messrs. Maull and Fox, 187 Piccadilly, London, W., or Messrs. S. Hildesheimer and Co., Ltd., 96 Clerkenwell Road, London.

OUR ASTRONOMICAL COLUMN.

Spectrum of the Pleiades Nebula.—Bulletin No. 55 of the Lowell Observatory contains an interesting account of the results secured by Mr. Slipher in the photography of the spectrum of the nebula in the Pleiades. This nebula, as Mr. Slipher points out, would doubtless naturally be classed as a gaseous nebula since in its prominent characteristics it resembles more the great nebula in Orion, the typical gaseous nebula, than the more numerous class of spiral nebulæ. However, with the 24-in. refractor of the Lowell Observatory he made an exposure of twenty-one hours, obtaining, as he states, a perfectly legible record. This spectrum was continuous and crossed by strong hydrogen lines, $H\beta$, $H\gamma$, $H\delta$, $H\epsilon$, and $H\zeta$, and fainter helium lines, those at 4026, 4381, and 4472 (combined with 4481) being recognisable. No trace of any of the bright lines seen in the spectra of gaseous nebulæ was found, but the spectrum resembled a copy of the brighter stars of the Pleiades. The result suggested that the spectrum might be due to light from Merope scattered and reflected by the large objective. Exposures on the nebula of Orion and of a region near Sirius, led him to conclude that "the nebula shines by light, the spectrum of which is a true copy of that of the neighbouring star Merope and of the other bright stars of the Pleiades." It is suggested then that the nebula is disintegrated matter similar to what we are acquainted with in our solar system, as in the rings of Saturn, comets, &c., and that it shines by reflected light.

Chromospheric (Solar) Lines in the Spectrum of ϕ Persei.—An interesting paper by Mr. Paul W. Merril forms part of Lick Observatory Bulletin No. 224. In the course of a survey of Class B stars having bright hydrogen lines, the author has measured a number of lines, bright and dark, between $\lambda\lambda$4340 and 6515 in spectrograms of this star, and connects these lines with "chromospheric" lines taken from Young's lists in Frost-Scheiner's "Astronomical Spectroscopy." It is to be regretted that the author has not employed a more recent authority. However, he considers the presence of "chromospheric" radiations in the stellar spectrum established. The star does not duplicate the solar chromosphere, for it is stated that the phenomena presented by helium, magnesium, and sodium are anomalously at variance with the chromospheric spectrum. This paper extends and confirms, apparently unconsciously, the conclusion previously arrived at by Sir Norman Lockyer and